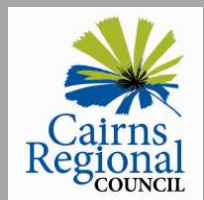




Environment Trends

Professor Bob Miles

Central Queensland University





*Sustainable
Regional
Development*

Miles

Consulting

Services

Global Environmental Trends and Drivers for Business Managers in a Climate of Change

Presentation by

Prof R.L MILES

St George Bank State of the Region Summit


June 2009

*“We do not inherit the world from our ancestors
- we borrow it from our children” 1900 anon*

Global Environmental Challenges for Business Managers

Outline

- 1. Global Forces: Trends and Drivers of Change and the Global Business Environment***
- 2. The Emerging Environmental Management Agenda***
- 3. Future Environmental Business Challenges and the Implications for Business***



**A Rapidly Changing
Society and Global
Business Environment**

Global Changes

1. Institutional Change

– APEC, NAFTA, ASEAN

2. Technology Change

– Global Transport, ITC platforms

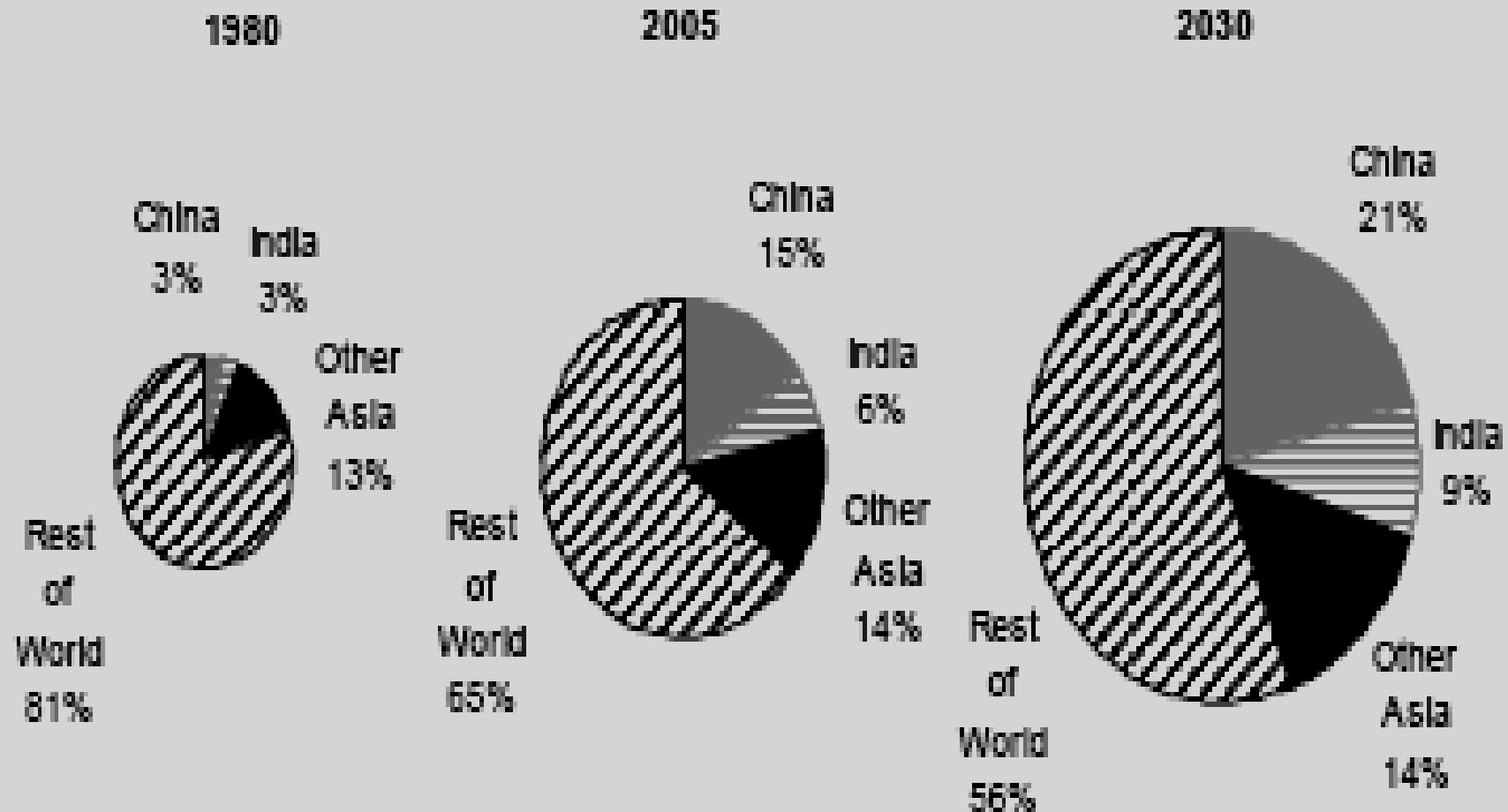
3. Organisational Change

– Outsourcing, Off-shoring, Multinationals

An Era of New Employees

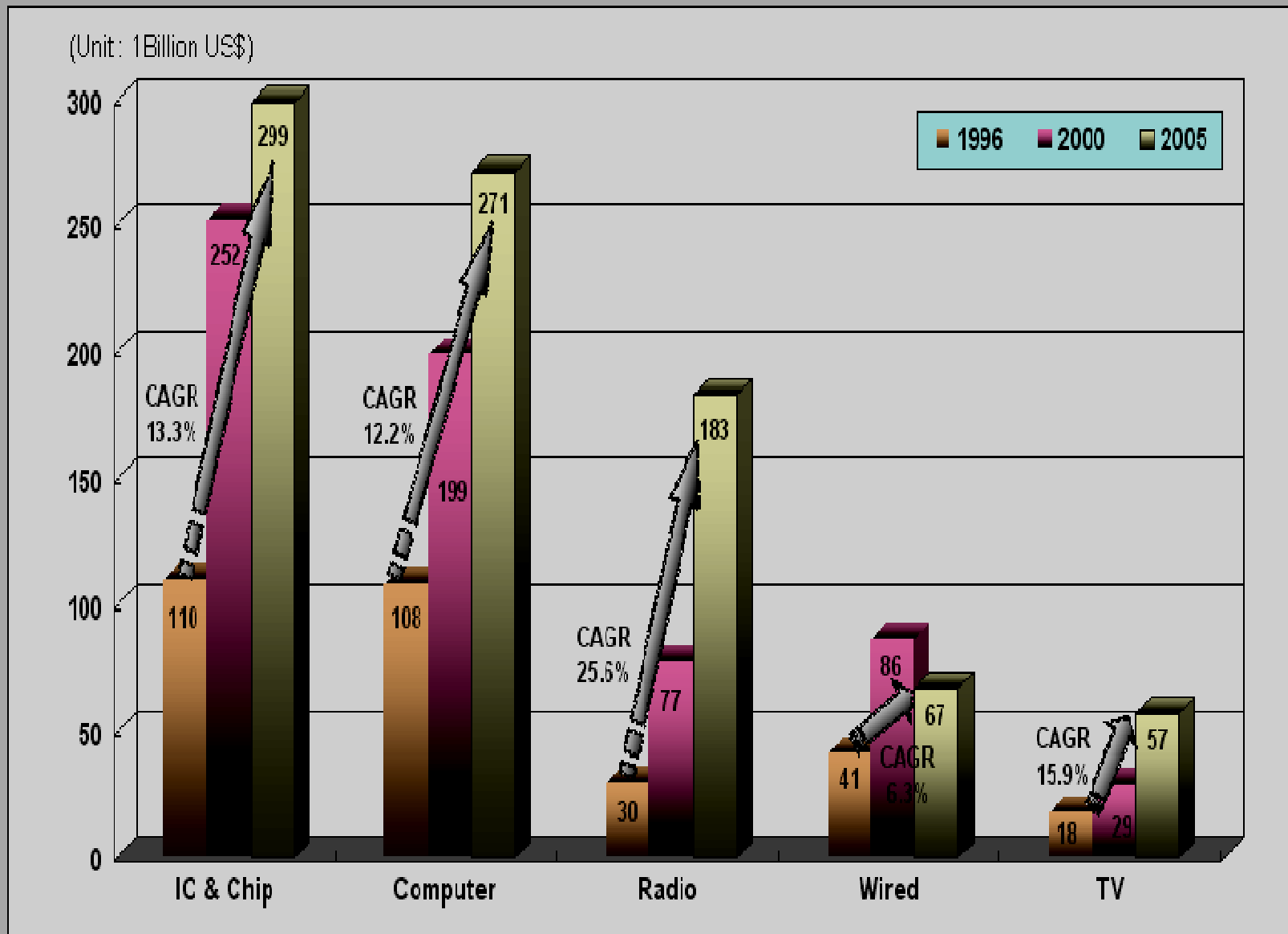
- **China 760 mil workers**
- **India 440 mil workers into the Global Economy**
- **260 mil new workers into labour market**
 - **Transition Economies (ie South Africa, Brazil)**

Asia's Share of Global GDP



Source: IMF and Treasury estimates.

Growth in ITC Industry – 1996-2005



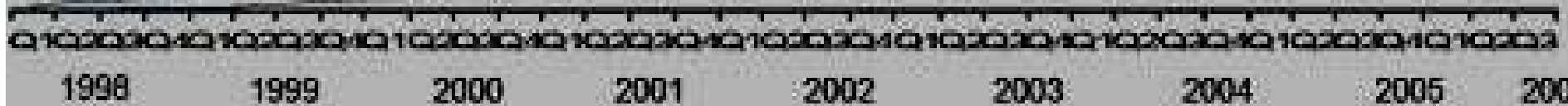
(Source : GTIS 2005)

Virtual Business Transactions

eBay's amazing growth!

105
Million
Listings

212
Million
Users



Generational Change

Four generations:

1. **Baby Boomers (stability, possessions and security)**
2. **X generation (earner learner, mobile)**
3. **Y generation (transient, no value in possessions, environmentally conscious)**
4. **Dot Coms (no pre-determined values)**

Generational Change

Historical	Today
Tradition	Innovation
Citizens	Customers
Ownership	Participation
Hierarchy	Empowerment
Experts	Peer Groups
Technical	Relational
Work Ethic	Work life balance
Regional	Global

Trends and Drivers of Change

- **Knowledge revolution/knowledge management**
- **Rise of the multinationals and corporate philanthropy**
- **Greater integration, collaboration and networking, asset-less**
- **Green is gold**
 - **Post carbon economies**
 - **Natural Capitalism**

Trends and Drivers of Change

- **A growing 40+ culture**
- **A widening urban-regional/rural divide**
- **Workforce culture and greater competition for ‘earner learners’**
- **Grey Nomads and Sea/Tree Change**

The Global Business Environment

- **Regions as Economic Powerhouses**
- **Regional and Global Connectivity and Competitiveness**
- **Modern Businesses - *not bounded by place* (Virtual and E-Business)**

The Emerging Environmental Management Agenda

- **QA, Pervasive Measurement, Trace back, Accountability**
- **Linking Engagement, Research, Education, Uptake and Regional Governance and Planning**
- **Influencing the Policy and Institutional Framework**
- **Environmental outcomes, Performance Scorecard, KPI and Benchmarks**

Future Environmental Business Challenges

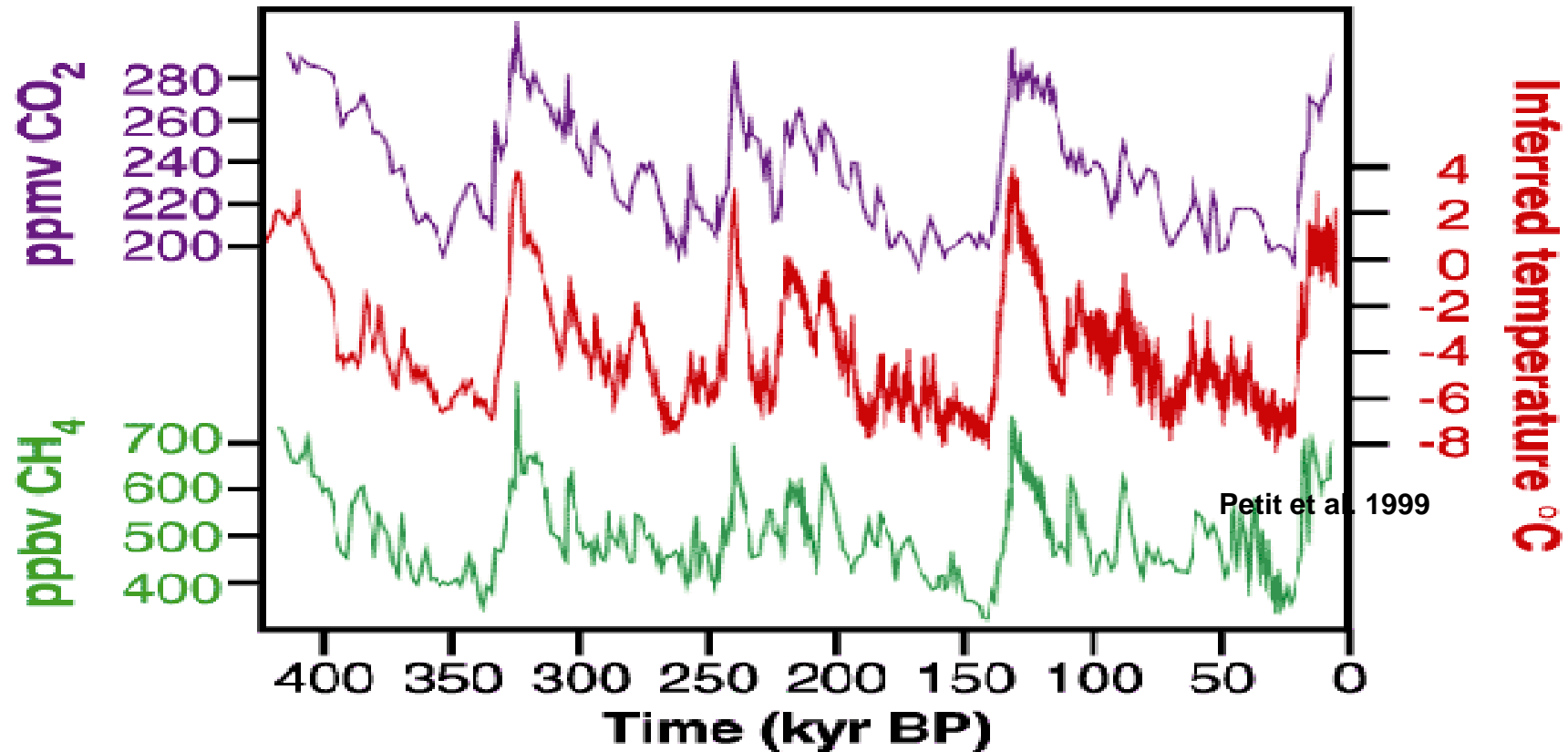
- **Managing coastal growth and recreational impacts**
- **Staying clean and green with global environmental drivers**
- **New citizenship – engagement**
- **Public-private partnerships**
- **Industry alignment – supply chains**
- **Consumer values – lifestyle and livability**
- **Knowledge as the new currency**
 - **Genetics, Biotechnology, Nutraceuticals**

Future Environmental Business Challenges

- **Aging workforce and community**
- **Community Cohesion, Vitality and Wellbeing**
- **Industry restructuring**
- **Attraction and retention of professionals and skilled workers**
- ***Climate Change***

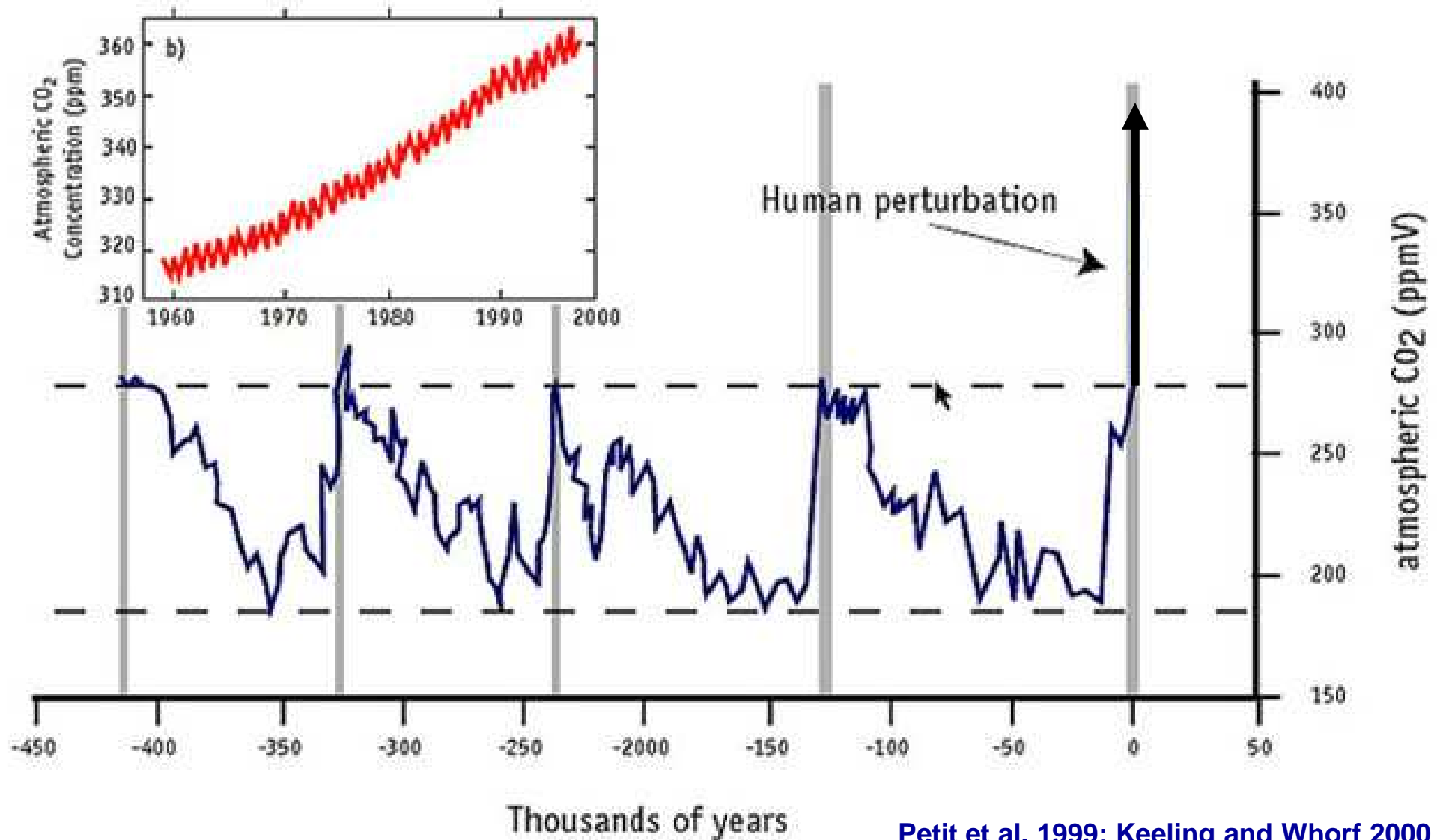
The Earth as a System

The Vostok Ice Core: Glacial-Interglacial Cycling

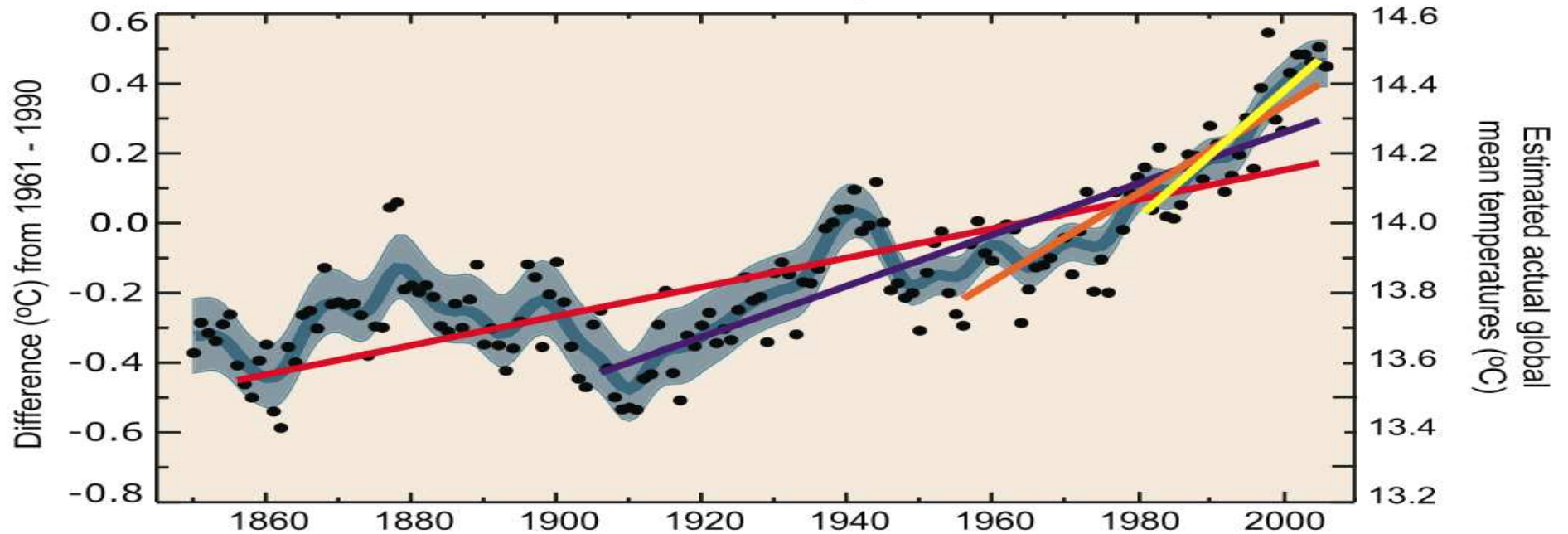


Note the high degree of self-regulation in the metabolism of the Earth System.

Human Perturbation of the Carbon Cycle: An Earth System Perspective



Global Mean Temperature

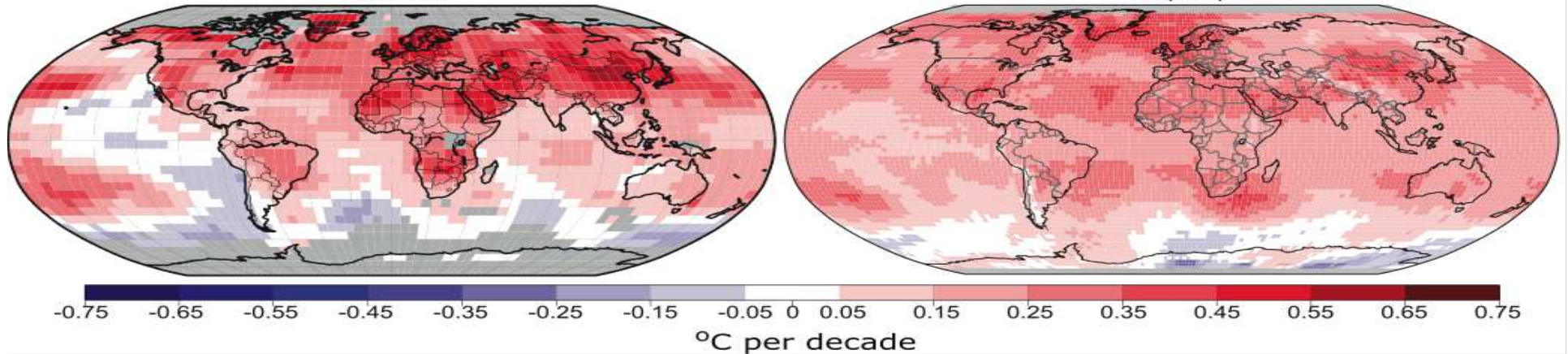


- Annual mean
- Smoothed series
- 5-95% decadal error bars

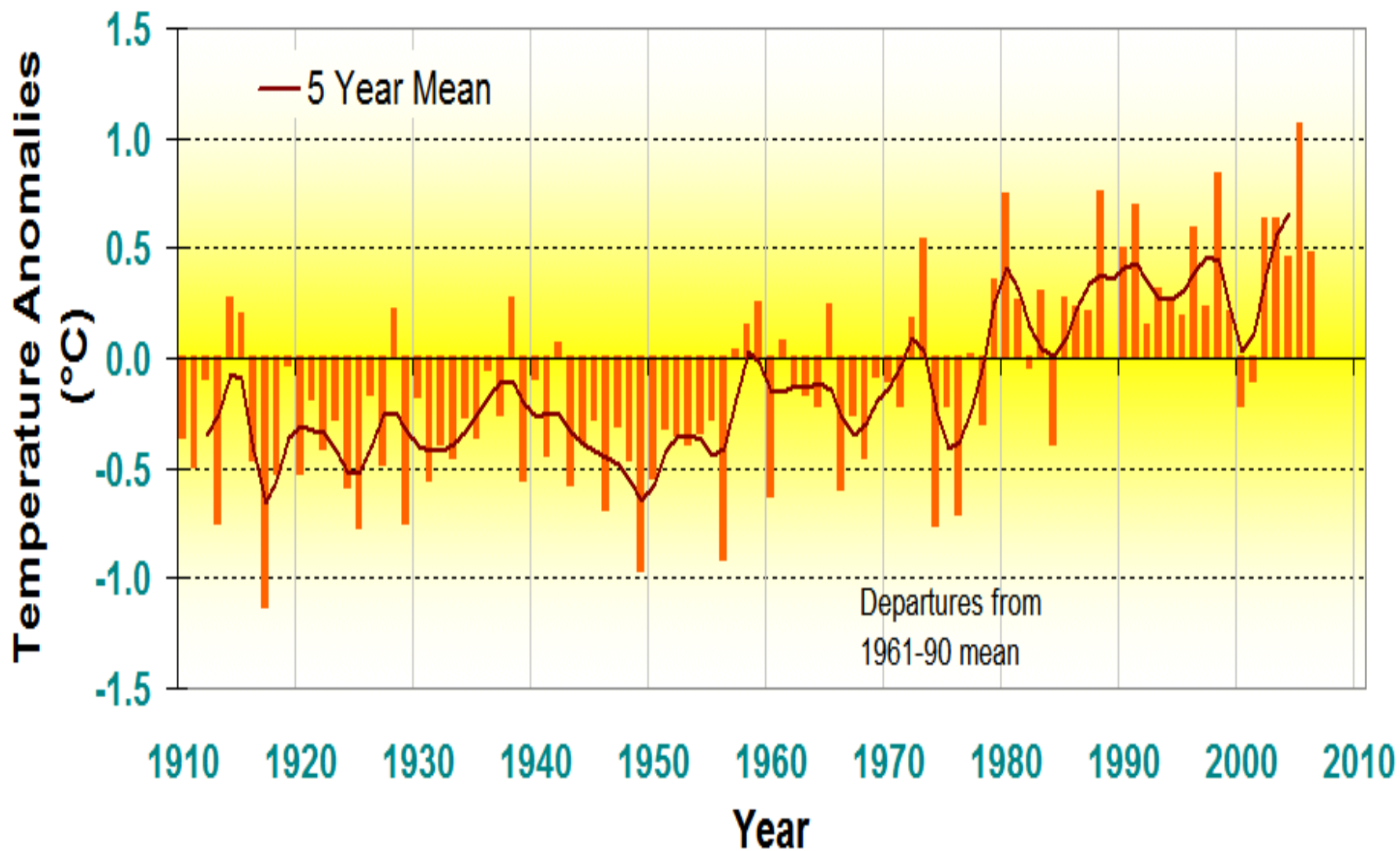
Period	Rate
Years	°C per decade
25	0.177 ± 0.052
50	0.128 ± 0.026
100	0.074 ± 0.018
150	0.045 ± 0.012

Surface

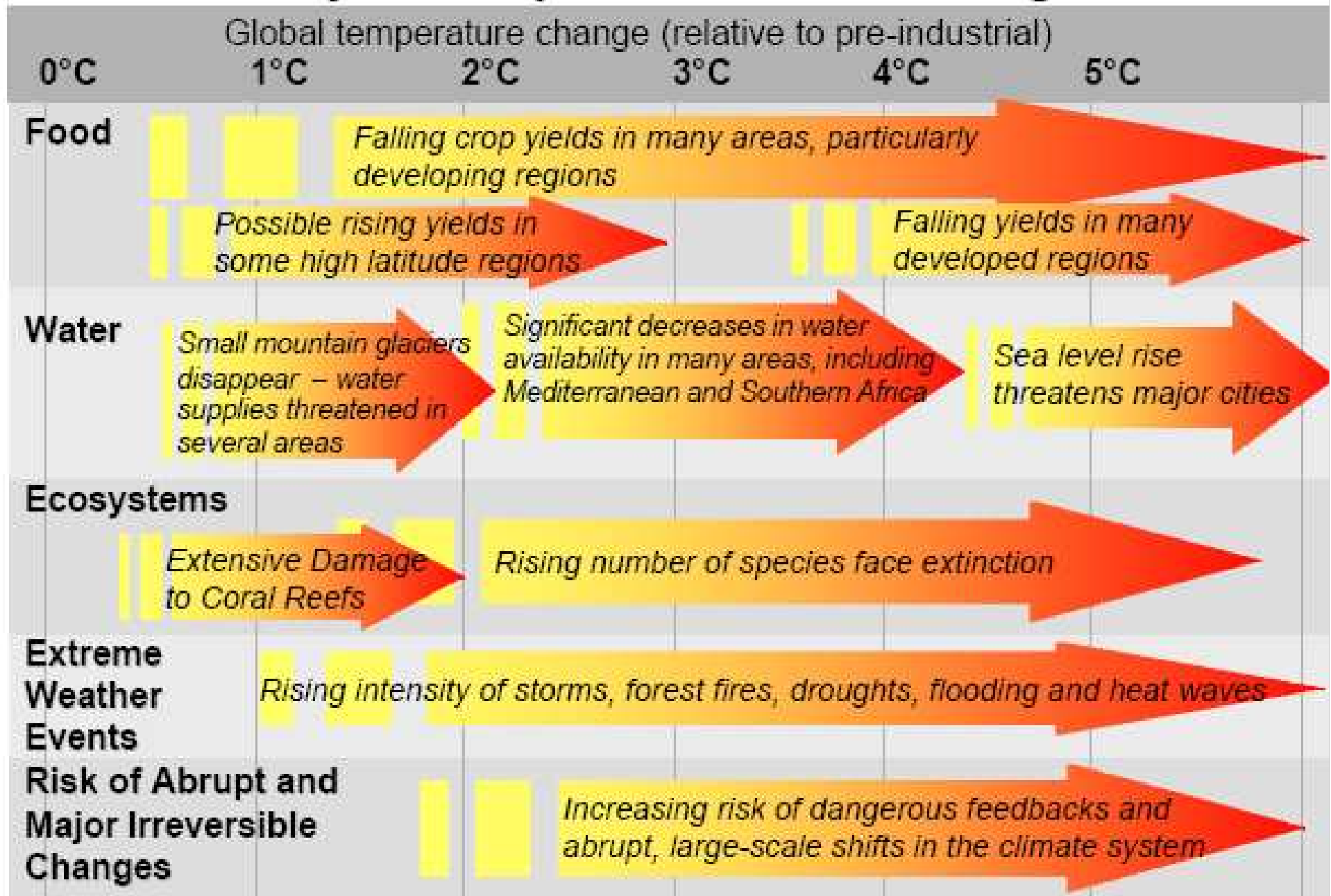
Troposphere



Annual Mean Temperature Anomalies For Australia



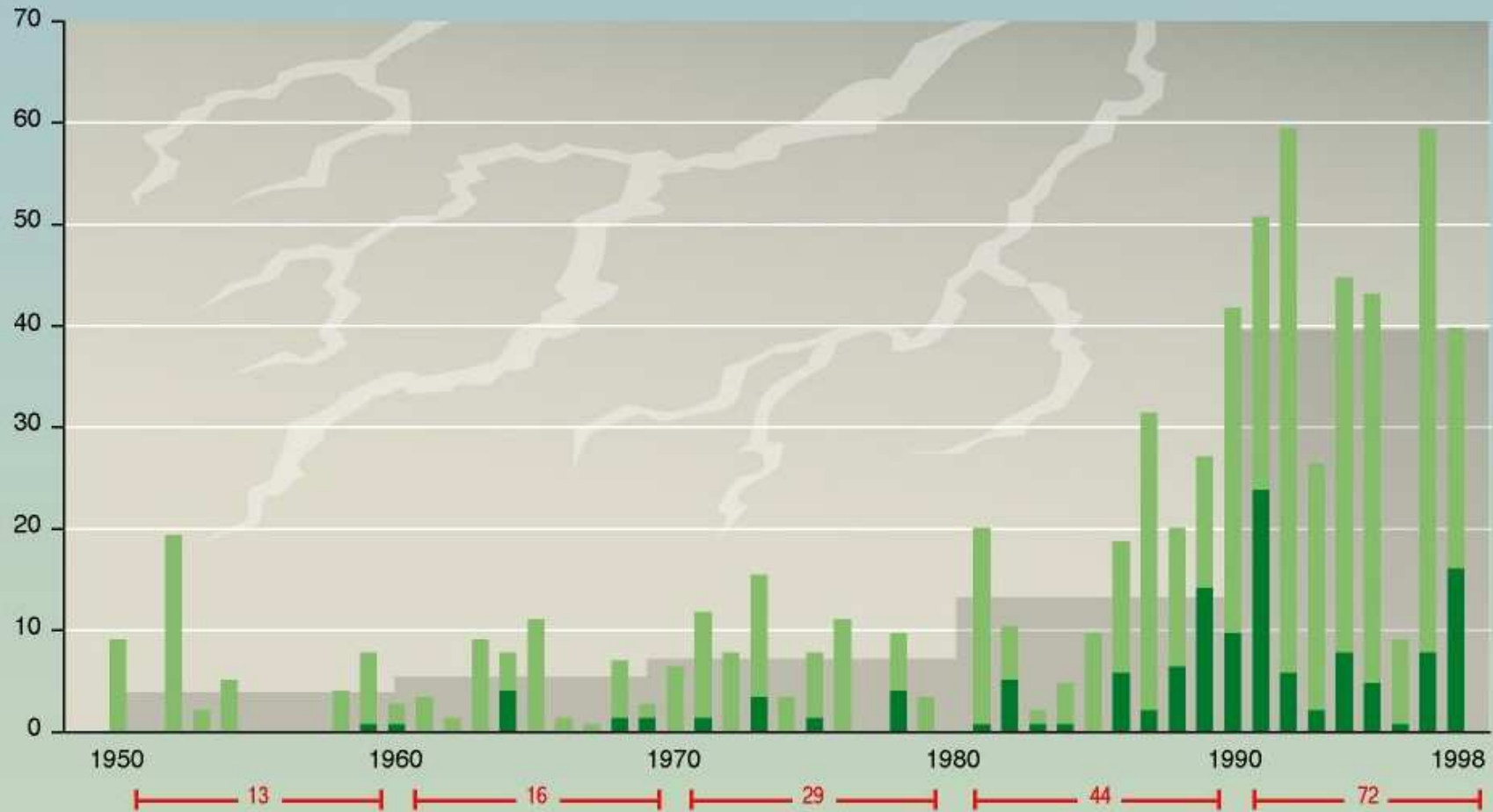
Projected Impacts of Climate Change



Source: Stern Review on the Economics of Climate Change

Global costs of extreme weather events (inflation-adjusted)

Annual losses, in thousand million U.S. dollars



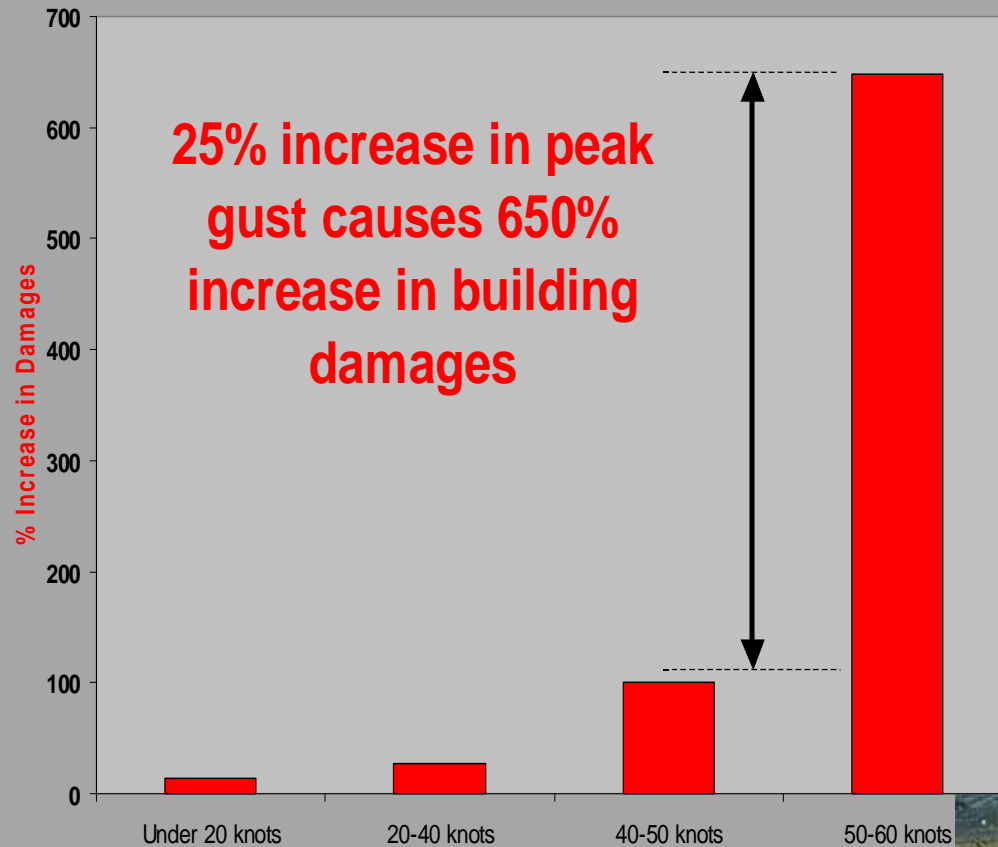
Recorded and Potential Economic Loss from Tropical Cyclones



STORM	CLASS	YEAR	1990 Insured Loss (\$100M)	1990 Insured Loss (\$100M) if Maximum wind speed increased by:		
				5%	10%	15%
Alicia	3	1983	2.4	3.4	4.3	5.7
Hugo	4	1989	3.7	4.9	6.5	8.5
Camille	5	1969	3.1	4.1	5.4	7.1

Source: AIG 2005

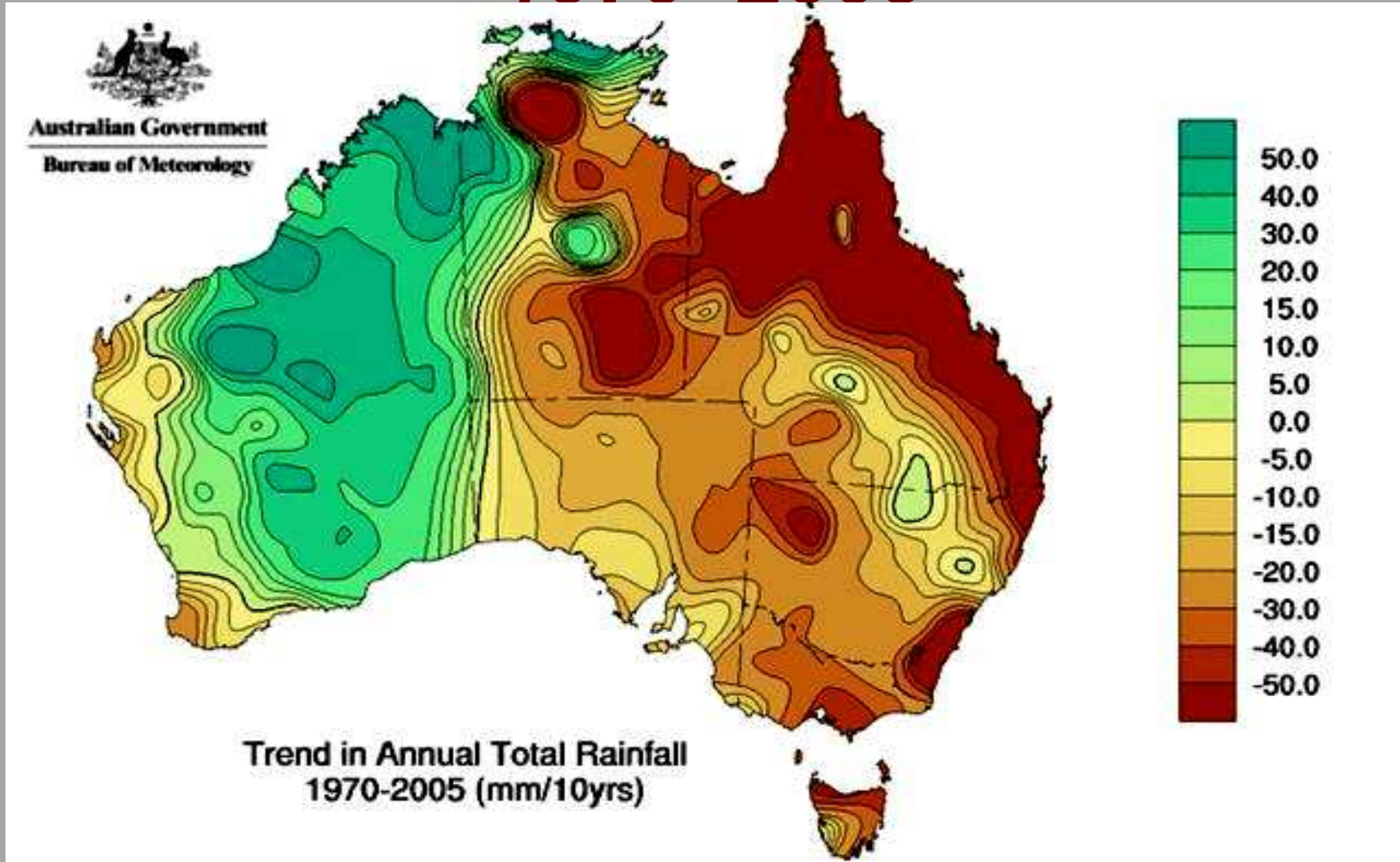
Small changes in hazard intensity can lead to multiple increases in damages

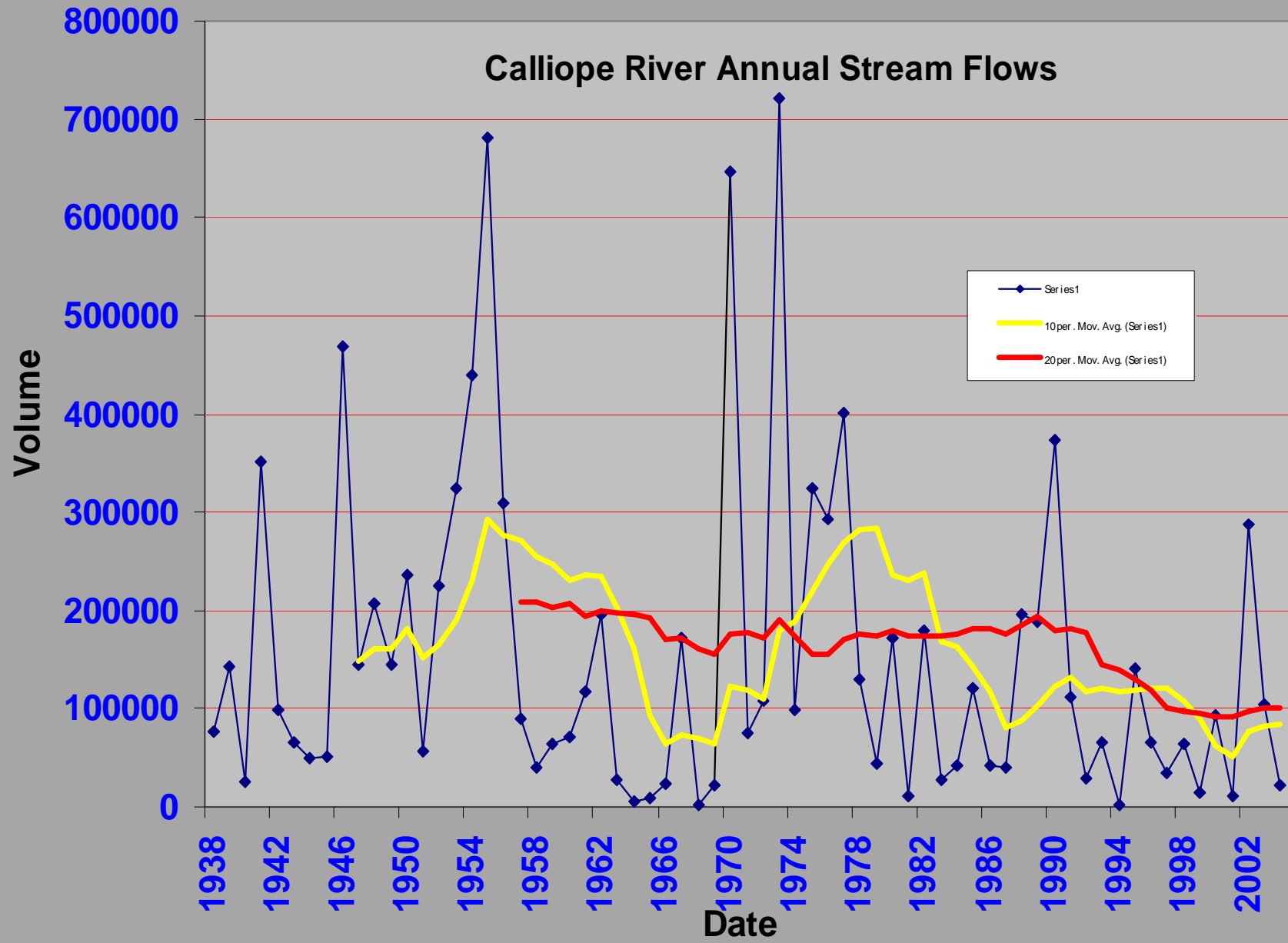


Source: Sydney Morning Herald 25th August 2003

NSW, NRMA Building Insurance only

Trend in Annual Rainfall 1970 -2005





Implications for Regional Australia

- Adequacy of the existing storages to cope with increased variability and reductions in rainfall**
- Vulnerability of Industry to water shortages**
- Infrastructure design and planning**
- Demands for environmental flows**
- Risks and impacts Agriculture**
- Water use efficiency (urban, industrial and Agriculture)**
- Coastal Zoning and Management**

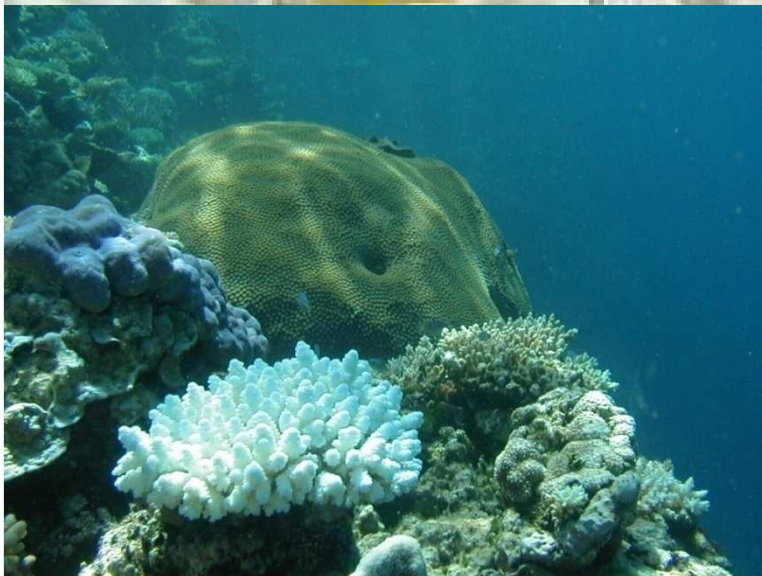


Implications for Regional Australia

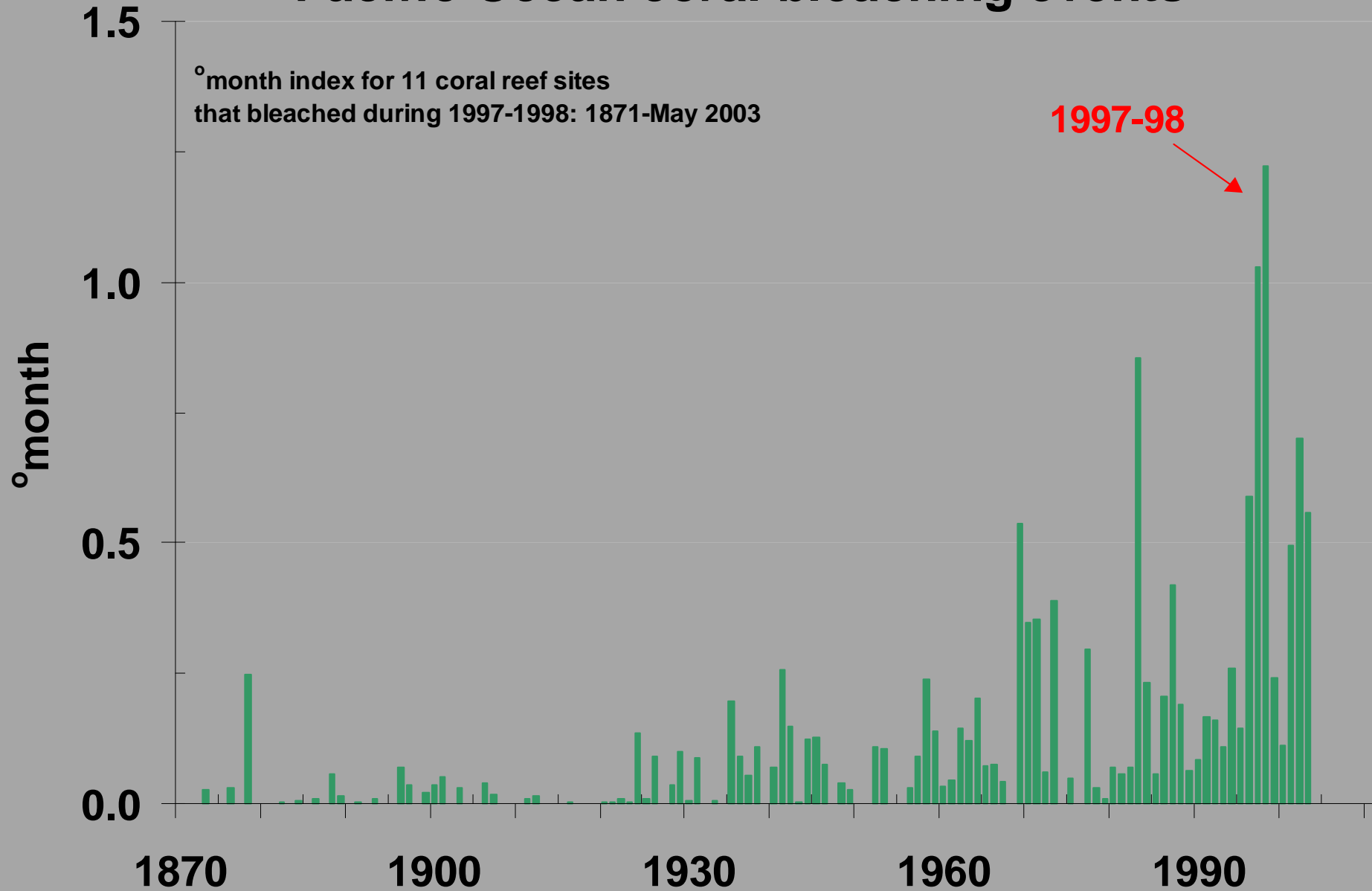
- **Water Reform and Full Costing**
- **Water Management and Governance**
- **Water Allocation and Trading**
- **Market Based Instruments**
- **Environmental Services**

Coral Bleaching

500,000,000 people directly dependent on the Reef

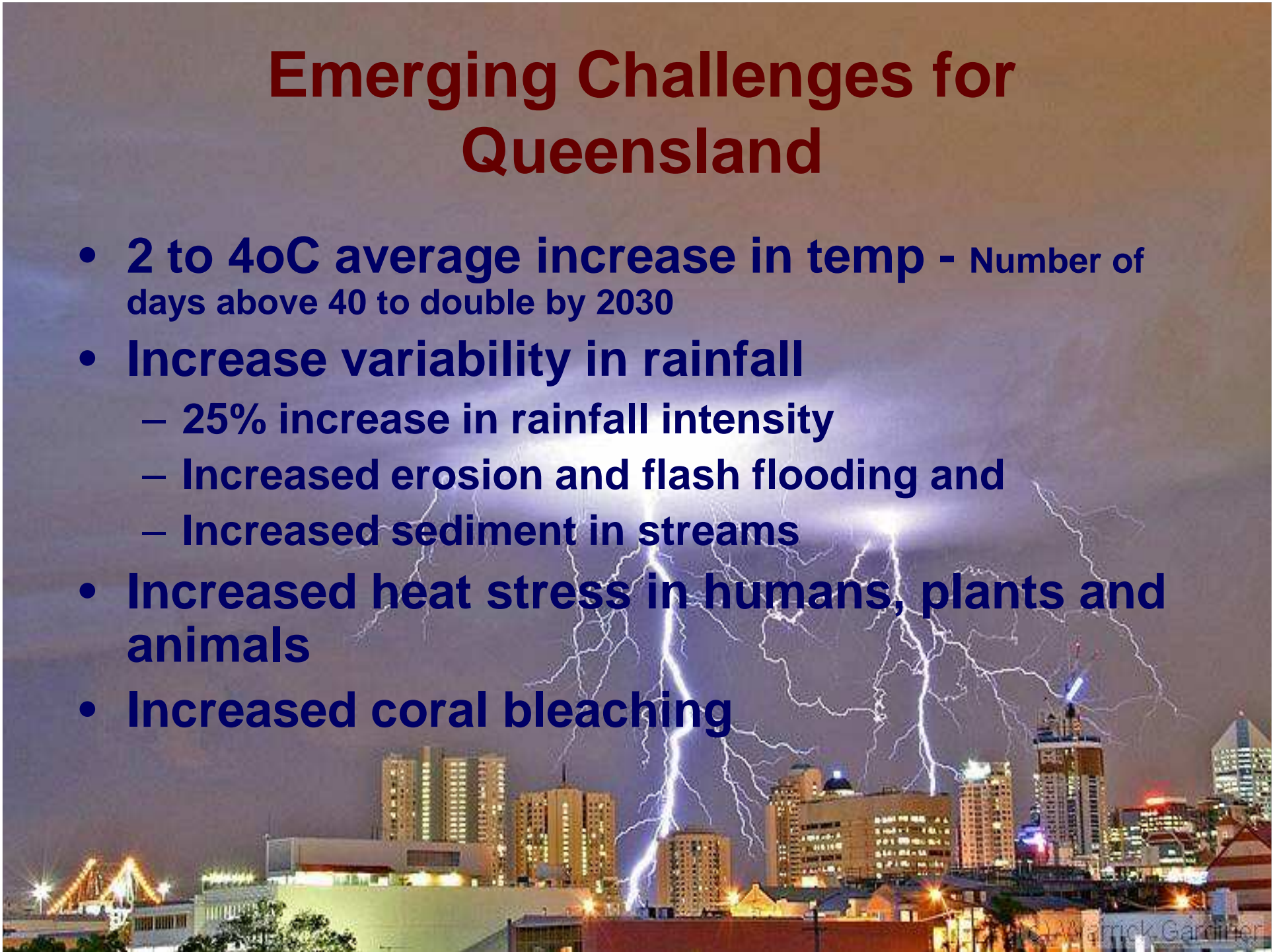


Pacific Ocean coral bleaching events



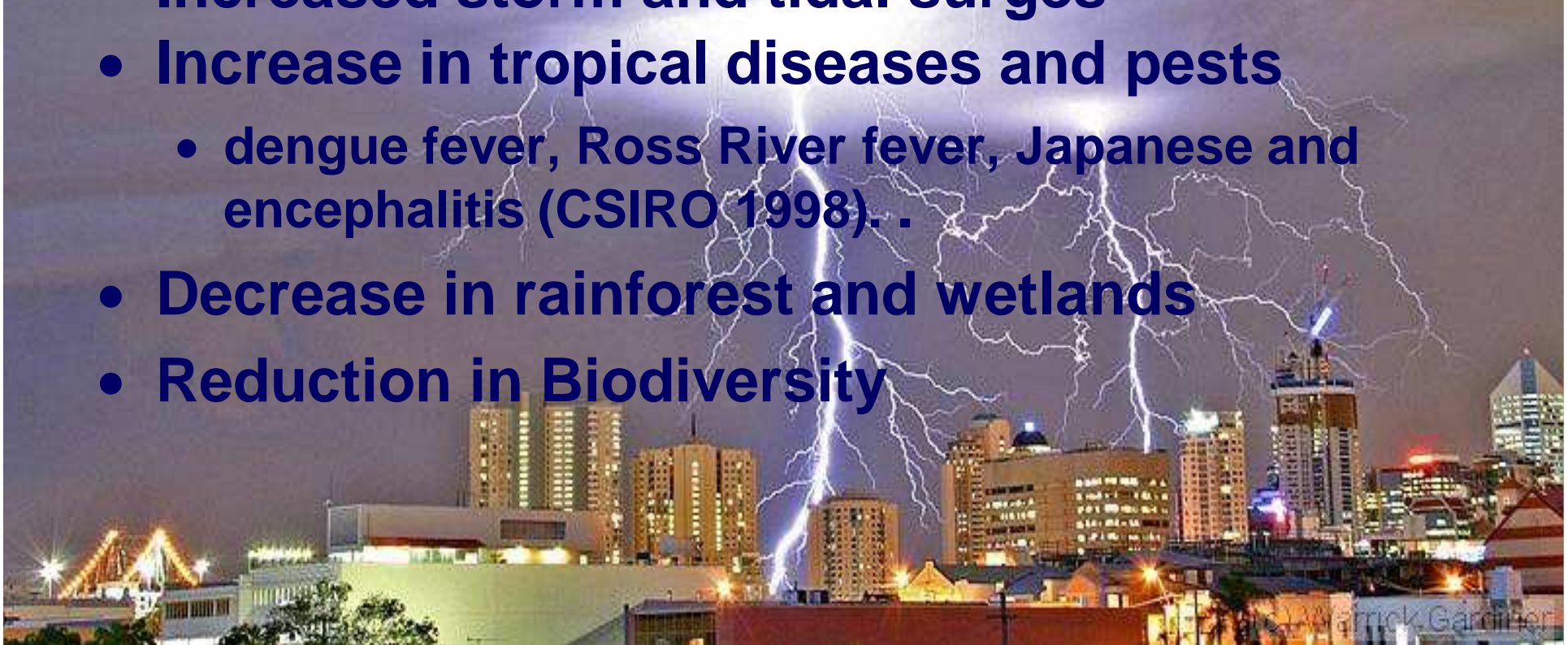
Emerging Challenges for Queensland

- **2 to 4oC average increase in temp** - Number of days above 40 to double by 2030
- **Increase variability in rainfall**
 - 25% increase in rainfall intensity
 - Increased erosion and flash flooding and
 - Increased sediment in streams
- **Increased heat stress in humans, plants and animals**
- **Increased coral bleaching**



Emerging Challenges for Queensland

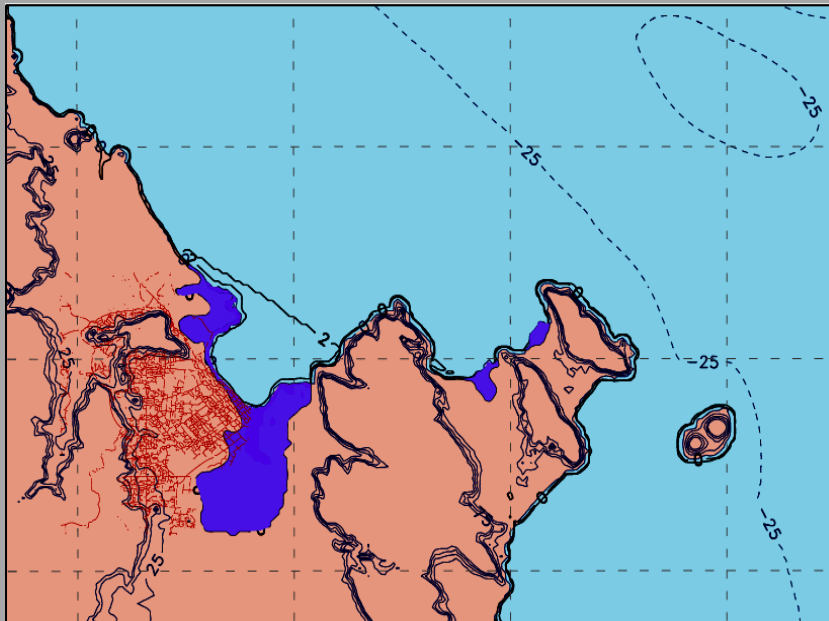
- 25% increase in wind speed and increased cyclone intensity, move south, more irregular
- Increased storm and tidal surges
- Increase in tropical diseases and pests
 - dengue fever, Ross River fever, Japanese and encephalitis (CSIRO 1998).
- Decrease in rainforest and wetlands
- Reduction in Biodiversity



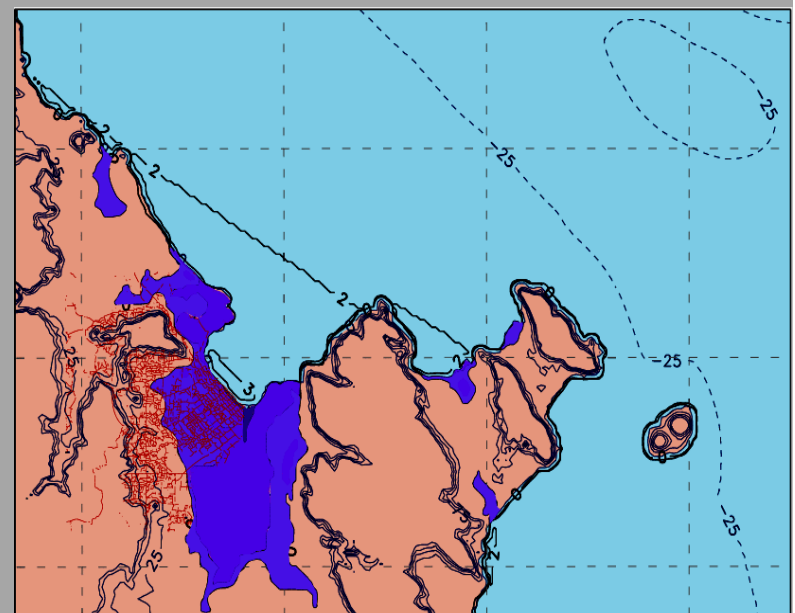
Climate Change and Storm Surge Inundation - Cairns

Current	Stronger Cyclones	Stronger Cyclones + Sea level rise
2.3 m	2.6 m	2.7 m – 3.0 m

Current 1-in-100 year storm surge extent



1-in-100 year storm surge extent under 2xCO₂ conditions



Flood area around Cairns doubles →

Early Manifestations of Global Warming

- Hottest European summer in 50,000 years.
- Unprecedented drought in western USA
- Most severe cyclone ever, 2002
- Record 19 cyclones in gulf of Mexico in 2005.
- Most severe ENSO event ever, 1998.
- Loss of Larson B Ice Shelf, Antarctica, 2001
- First South Atlantic hurricane, 2003
- Widespread rainfall deficits across southern Australia.
- CO₂ in atmosphere increased by 3 parts per million in 2003-7, far worse increase than predicted.

Early Manifestations of Global Warming

- **67% of the Glaciers in the Himalayas have gone in the thirty years. These mountains supply 40% of the Globes population with water**
- **The melt-water of the Greenland ice-sheet now equals the Nile's annual flow.**
- **The long trend of warming temperatures is now melting the high altitude permafrost - some buildings, bridges and roadways are now threatened with unstable foundations.**

Environmental Drivers Influencing Business

- **Increased temperatures**
- **Increased demand and competition for water**
- **Increased sensitivity and interest in the environment**
- **Changing attitudes effecting consumer preferences**
 - Type of products purchased
 - Transport systems



Emerging Business Opportunities

- Insurance and risk management
- Architecture and landscape planning
- Flood plain management
- Plant breeding
- Forestry and carbon sequestration
- Coastal engineering
- Natural resource management, conservation and system biology and ecology
 - Terrestrial and aquatic



Emerging Business Opportunities

Water Use

- **Xero-scapes and landscape architecture**
- **Irrigation technology**
 - Domestic, urban landscape, agriculture and recreational
- **Water recycling and reuse technologies**
 - Urban, industrial and agricultural
- **Reverse osmosis and desalinisation**



Emerging Corporate Values

- **Lifestyle and liveability**
- **Health and wellbeing**
- **Community service obligations**
- **Green credits, carbon trading and offsets.**
- **Closed loop systems and minimum biological impact**

What it means for Regions and Business

- **Differentiated/Market Niche**
- **More Business Model Focus**
- **Partnerships or Perish**
- **Public Private Partnerships**
- **Pressure to find new Funding Sources**
- **Environmentally aligned businesses**

What it means for Regional and Business

- **Stronger Regional Governance**
- **Engaged Government (all tiers)**
- **Public Private Partnerships**
- **Community Service Obligations**
- **Regional Integrated Planning**
- **Local Government as Economic Development Agencies**

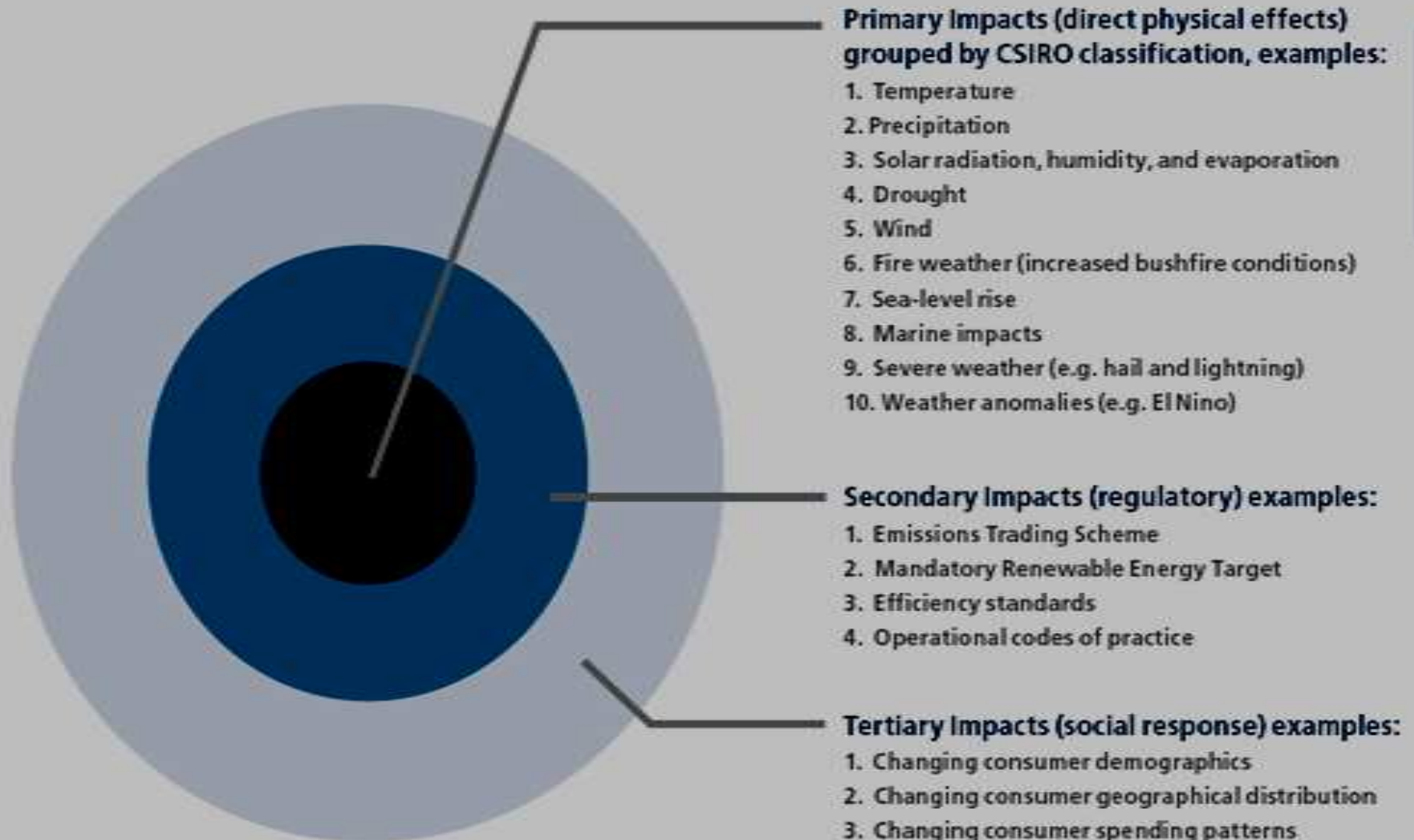
Conclusions

- ✓ **Our business environment is changing rapidly driven by global trends**
- ✓ **Climate change is a global driver and the single biggest challenge confronting Regions and Business**
- ✓ **Business and Regions need to be differentiated, market driven, eco-friendly and be globally aligned**

Climate Change

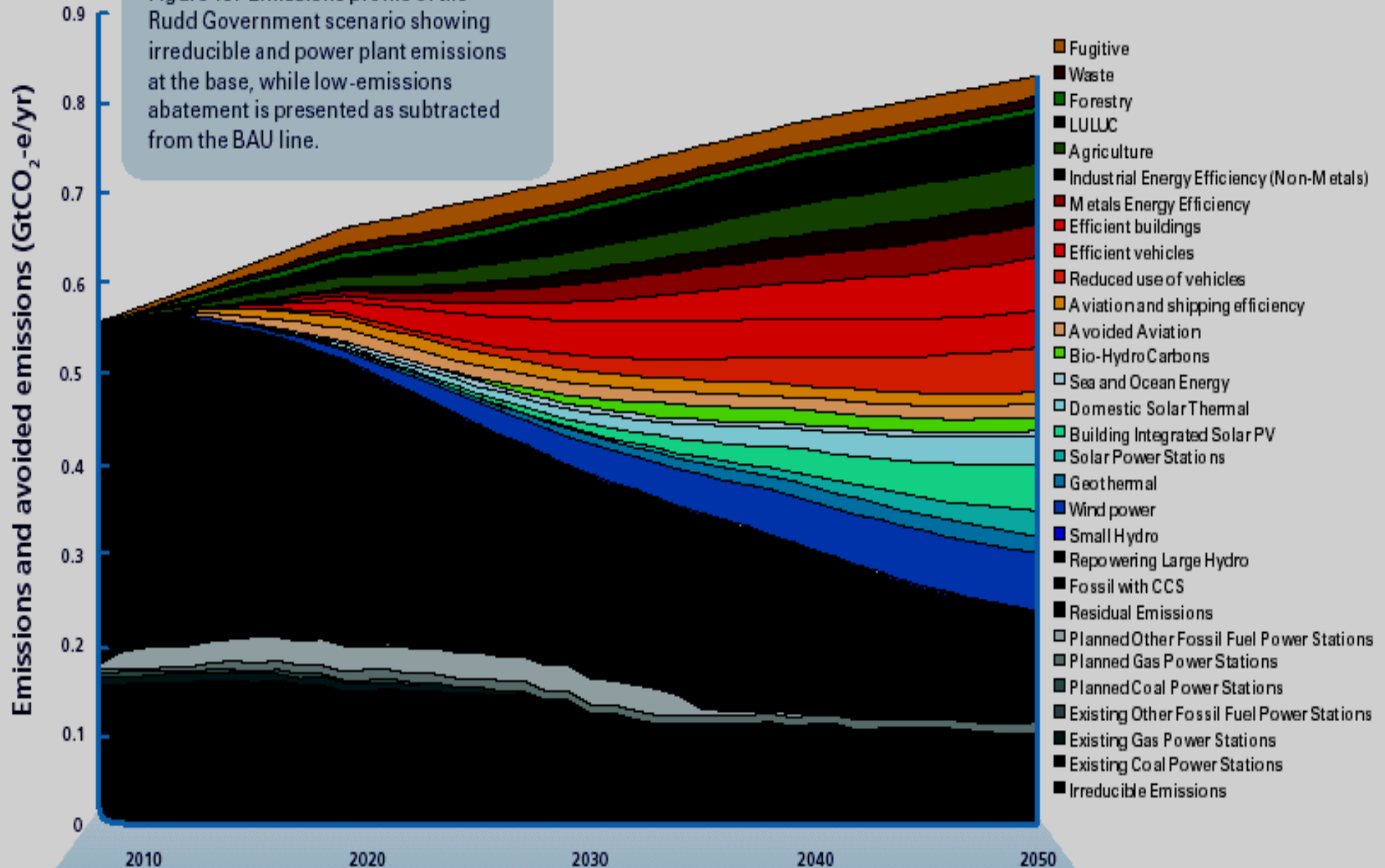
**Business Costs and
Opportunities**

Three areas of impact

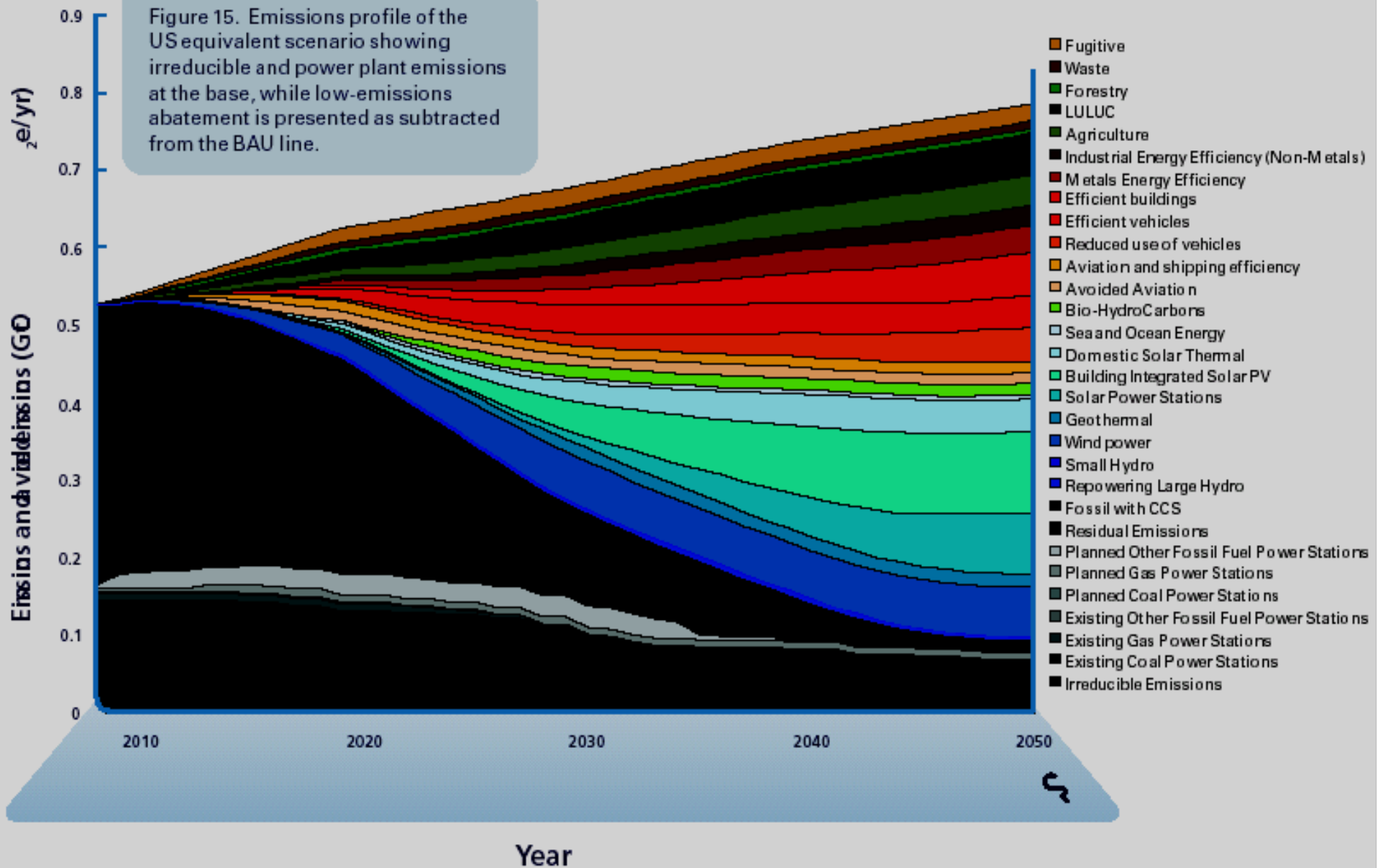


Windows of business opportunity

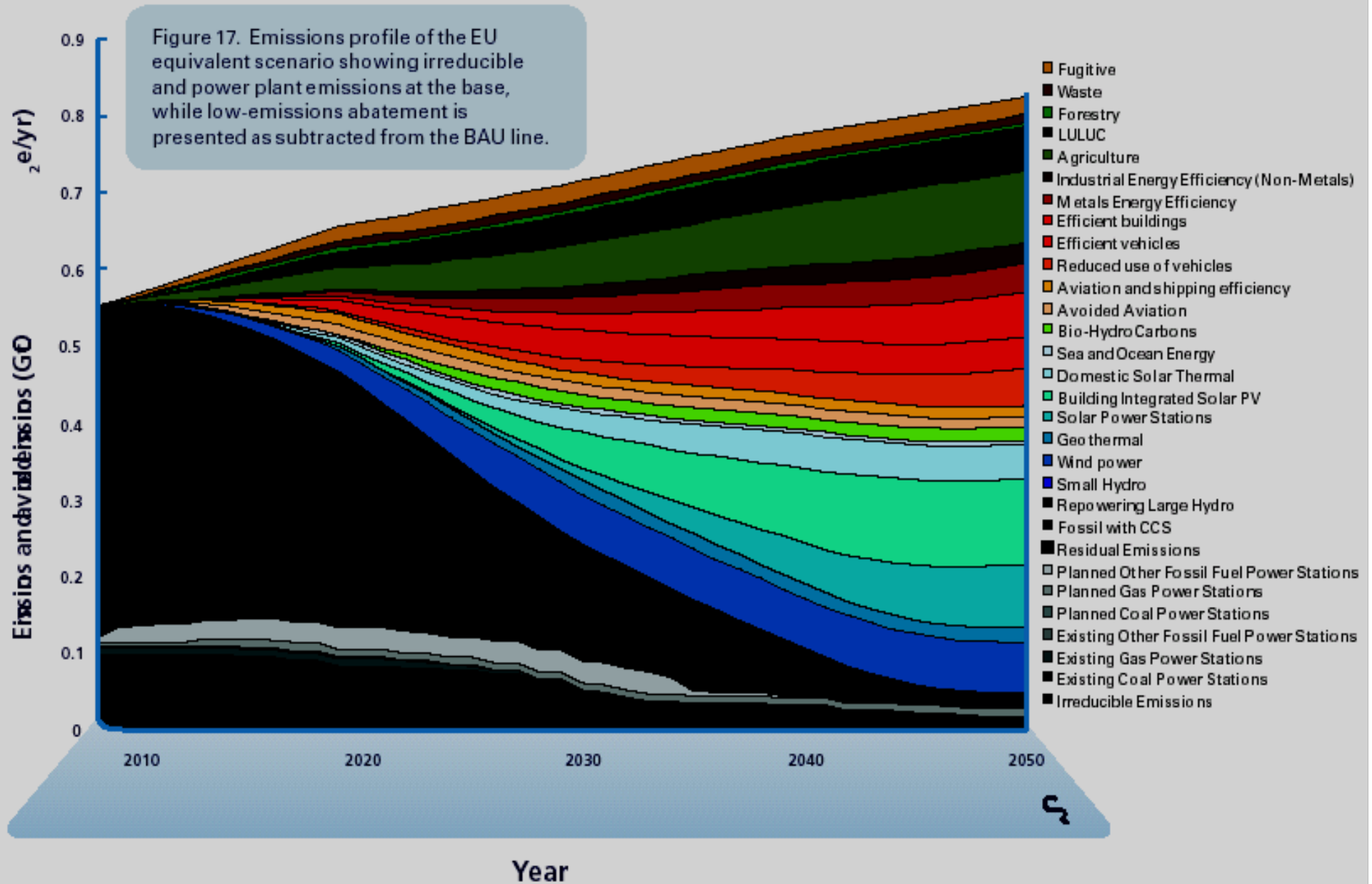
Figure 13. Emissions profile of the Rudd Government scenario showing irreducible and power plant emissions at the base, while low-emissions abatement is presented as subtracted from the BAU line.



Windows of business opportunity



Windows of business opportunity



What does it mean for business

Actions to address climate change will impact:

Positively: because there are many sectors engaged in activities and resources that can reduce emissions – new business models and more efficient ways of doing things.

Negatively: because there are some activities that are highly likely to be constrained by the emerging interests in carbon.

Farmers are a good example to business adapting.

Farmer adapting to new business opportunities



Crops (& livestock)



Energy



Water



Carbon



The Economics of Climate Change



Growing the Green Collar Economy: Skills and labour challenges in reducing our greenhouse emissions and national environmental footprint

Report to the Dusseldorf Skills Forum

Dr Steve Hatfield-Dodds
Dr Graham Turner
Dr Heinz Schandl
CSIRO Sustainable Ecosystems

Tanjua Doss
The Allen Consulting Group

June 2008

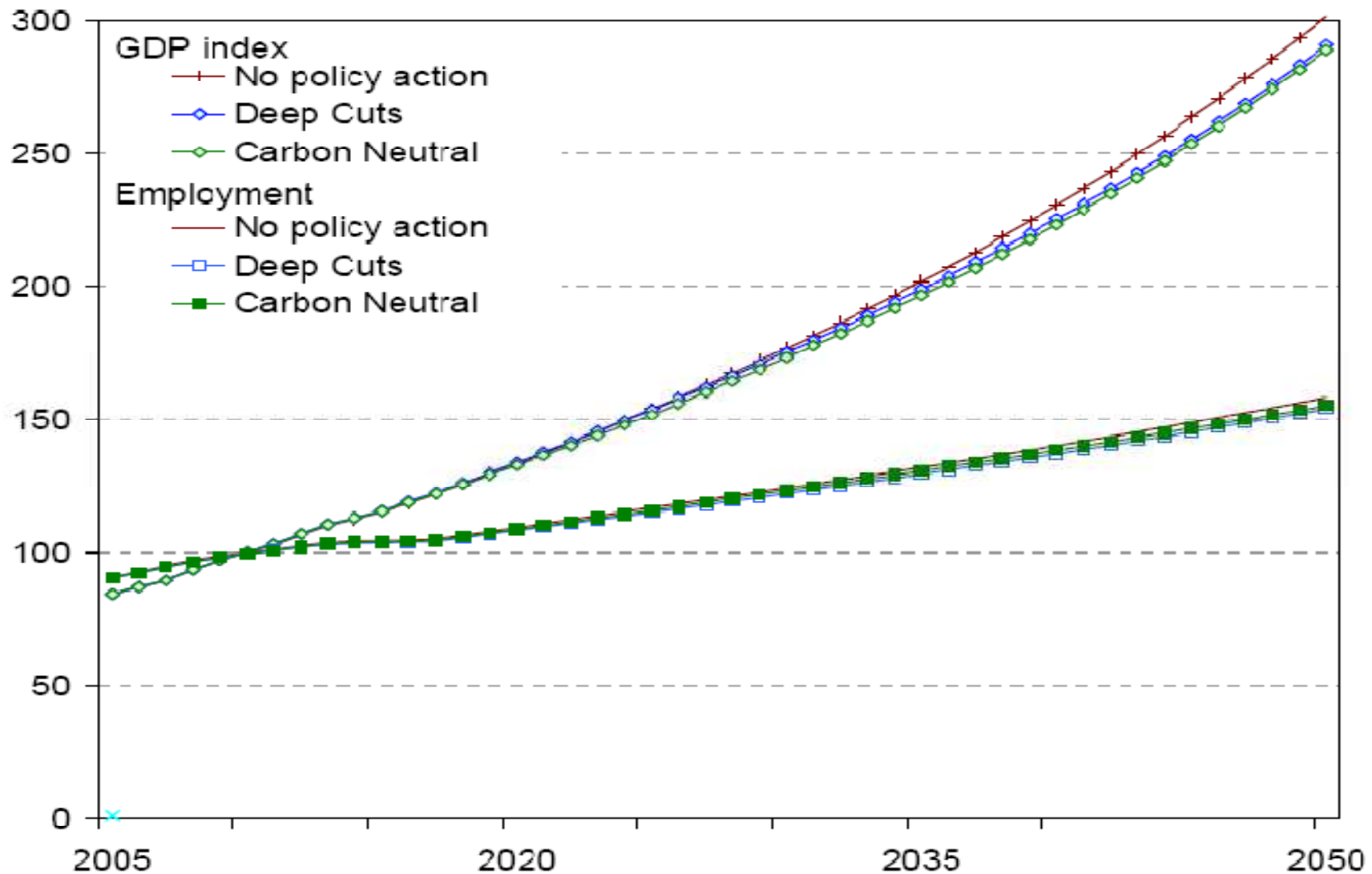
Table 1 Change in employment and sector employment shares, ASFF Factor 4 scenario, 2006-2026

	Change in Employment				Employment share	
	2006 - 2016		2006 - 2026		2006	2026
High material flow sectors						
Agriculture, fishing and forestry	14,015	4%	25,433	8%	3%	2%
Food and drink	22,422	13%	41,830	24%	2%	2%
Mining and energy commodities	9,081	82%	25,638	231%	0.1%	0.1%
Recycling	31	10%	48	15%	-	-
Manufacturing	34,578	4%	94,690	11%	9%	8%
Transport	39,896	23%	78,923	45%	2%	2%
Construction	109,145	24%	159,326	36%	4%	5%
	229,170	11%	425,888	21%	20%	18%
Low material flow sectors						
Business, finance, communications, hospitality and public services	718,778	14%	1,517,410	30%	50%	48%
Retail and wholesale trade	735,267	25%	1,426,214	48%	30%	33%
	1,454,045	18%	2,943,625	37%	79%	81%
Total	1,683,215	17%	3,369,513	34%	100%	100%

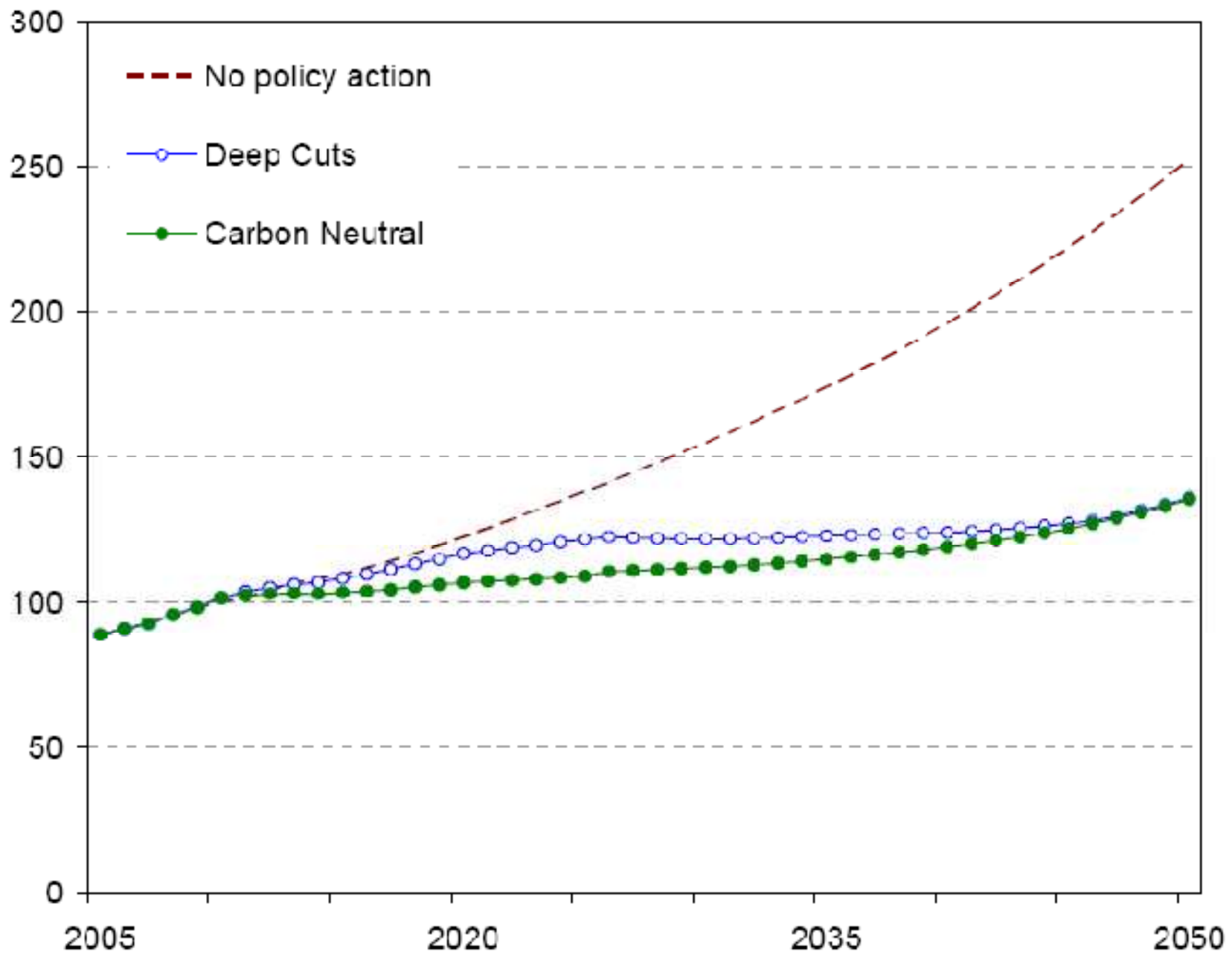
Figure 1 Overview of outcomes of CGE emission reduction scenarios, 2005-2050 (2010 = 100)

Source: Data from The Climate Institute, see Hatfield-Dodds et al 2007

a) *Economic growth and employment*



(b) Final energy use



(c) Greenhouse gas emissions

